



# THE BMW GROUP GUIDE TO ALTERNATIVE FUELS.

**There is now a multitude of alternatively fuelled vehicles available offering different systems for efficient running, from conventional hybrids to pure electric and electric range extender cars, to plug-in hybrids and hydrogen fuel-cell vehicles.**

Each have their own set of unique benefits, and are generally classed as ultra-low emission vehicles (ULEV). Choosing the right vehicles for your business can offer significant savings and also enable a greener fleet.

Ultra-low emission vehicles (ULEV) may be described as those emitting 75g/km or less of CO<sub>2</sub>. Strong government incentives are in place to persuade motorists to switch to a ULEV in pursuit of wider EU emissions and pollution targets.

In this BMW Guide to Alternative Fuels, we explain what is available in terms of running costs and benefits, and illustrate the differences between each technology and how they might work for you.

**BMW Group** Fleet & Business Sales



## REGULATORY FRAMEWORK.

Before adopting ultra-low emission vehicles as company cars, it is important to understand the funding and infrastructure around them. Only then can you ascertain which types of vehicles best suit your business needs.

### Government incentives and grants.

To help stimulate the UK market and support the cost of introducing radical new automotive technologies, government grants are available for some ULEVs.

Since 2011, businesses have been able to subsidise the purchase of electric and part-electric cars and vans with the Plug-in Car and Plug-in Van Grants (PiCG). These subsidise acquisition by up to 25% of the cost of the car, up to a maximum of £5,000. For vans, the amount is up to 20%, to a maximum of £8,000.

The grants are administered by the Office for Low Emission Vehicles (OLEV), and the process of application is managed by the vehicle manufacturer and its retailer network rather than the purchaser.

There is some paperwork for the fleet, as well as a simple questionnaire on usage to give OLEV information on how the vehicle is to be used, all of which are supplied by the retailer.

There were changes to the grant that came into effect in April 2015. Buyers can claim back 35% of the vehicle's on-the-road price, but as the PiCG remains capped at £5,000 these changes really affect only electric vehicles with an on-the-road price of less than £20,000.

\* Accurate as of November 2015.

### Vehicle categories eligible for the full grant:

- **Category 1:**  
CO<sub>2</sub> emissions of 50g/km or less and a zero-emission range of at least 70 miles
- **Category 2:**  
CO<sub>2</sub> emissions of 50g/km or less and a zero-emission range of 10-69 miles
- **Category 3:**  
CO<sub>2</sub> emissions of 50–75g/km and a zero-emission range of at least 20 miles

The Government Grant scheme has been guaranteed by the government to continue until 2020\*.



### BENEFIT-IN-KIND TAX.

The driver of a company car that is classed as a ULEV is liable for Benefit-in-kind tax at a lower rate because of its lower emissions.

For a car with CO<sub>2</sub> emissions of 0-50g/km, the rate is 5% (8% for diesels) in 2015/16. From April 6, 2016, the 3% diesel tax charge is abolished and the rate rises to 7%.

In April 2017, the rate rises to 9%, with further rises to 13% and 16% in 2018 and 2019.

The BIK tax rates for ULEVs are shown in the table below:

CO <sub>2</sub> g/km	BIK % 2015/16	BIK % 2016/17	BIK % 2017/18	BIK % 2018/19	BIK % 2019/20
		(Diesel +3%)	No diesel tax charge		
0–50	5 (8)	7	9	13	16
51–75	9 (12)	11	13	16	19

For company cars that are fuel-electric hybrids or all-electric and have a rechargeable battery, the price of the vehicle for BIK tax purposes must always include the cost of the battery, regardless of whether or not it is leased separately. If an employer leases a battery for an employee's company car, it constitutes a taxable benefit that normally would be based on the cost to the employer.

### Other incentives for ULEVs include:

- Exemption from annual VED in 2015/16. From 1 April 2017, only cars with zero CO<sub>2</sub> emissions are exempt from VED
- Exemption from London Congestion Charging in 2015/16
- First Year Capital Allowance (FYA) of 100%, applicable until March 31, 2018 (except for leased cars)

Ultra-low emission vans are not affected by CCT because they are subject to Van Benefit Charge which is not currently emissions-dependent.

## ALTERNATIVE FUEL VEHICLE COMPARISON.

DRIVETRAIN	PLUG-IN HYBRID (PHEV) – EG. BMW X5 (PARALLEL HYBRID)	ELECTRIC VEHICLE (EV) – EG. BMW i3	ELECTRIC RANGE-EXTENDED VEHICLE (E-REV) – EG. BMW i3 RANGE EXTENDER (SERIES HYBRID)	HYDROGEN FUEL CELL VEHICLE – EG. TOYOTA MIRAI	TRADITIONAL HYBRID – EG. TOYOTA PRIUS, HONDA INSIGHT (PARALLEL HYBRID)
DESCRIPTION	A petrol or diesel engine works with a battery to power an electric motor. Both power units can be used together or individually, and the combustion engine can charge the battery.	The car carries a battery to power an electric motor that drives the wheels. It is charged by plugging it into an electricity supply.	A vehicle driven by an electric motor, but also fitted with a small internal combustion engine which recharges the battery but does not drive the wheels.	A vehicle fuelled by hydrogen and oxygen to generate electricity in a fuel cell stack to drive the car via an electric motor.	Uses a combination of petrol or diesel engine and electric motor to reduce fuel consumption and emissions.
PLUG-IN CAR GRANT (PICG) ELIGIBILITY	Plug-in hybrid cars with CO <sub>2</sub> emissions of 75g/km or less qualify for the government £5,000 plug-in car grant, subject to approval.	All EVs classified as cars have zero CO <sub>2</sub> emissions so qualify for the government £5,000 plug-in car grant, subject to approval.	All current range-extender electric cars have CO <sub>2</sub> emissions of 75g/km or less so qualify for the government £5,000 plug-in car grant, subject to approval.	As the only tailpipe emission is water vapour, hydrogen fuel-cell vehicles are eligible for the Government £5,000 plug-in car grant, subject to approval.	Hybrid cars that don't require an electric plug do not qualify for the Government plug-in car grant.
BIK TAX IMPLICATIONS	Drivers of ULEVs with CO <sub>2</sub> emissions of 0-75g/km are eligible for BIK tax starting at 5% (8% for diesels) in 2015/16, rising to 7% a year in 2016/17, 9% in 2017/18, 13% in 2018/19 and 16% in 2019/20.	Drivers of ULEVs with CO <sub>2</sub> emissions of 0-75g/km are eligible for BIK tax starting at 5% (8% for diesels) in 2015/16, rising to 7% a year in 2016/17, 9% in 2017/18, 13% in 2018/19 and 16% in 2019/20.	Drivers of ULEVs with CO <sub>2</sub> emissions of 0-75g/km (which includes all current range-extender cars) are eligible for BIK tax starting at 5% (8% for diesels) in 2015/16, rising to 7% a year in 2016/17, 9% in 2017/18, 13% in 2018/19 and 16% in 2019/20.	Drivers of ULEVs with CO <sub>2</sub> emissions of 0-75g/km are eligible for BIK tax starting at 5% (8% for diesels) in 2015/16, rising to 7% a year in 2016/17, 9% in 2017/18, 13% in 2018/19 and 16% in 2019/20.	Traditional hybrids have low CO <sub>2</sub> emissions, but are more in line with the best-performing diesels for BIK tax and fuel-efficiency. The lowest BIK tax band for a traditional hybrid in 2015/16 is 9% (Toyota Yaris Hybrid).
LONDON CONGESTION CHARGE ELIGIBILITY	The 75g/km CO <sub>2</sub> emissions threshold for the London Congestion Charge means any car with CO <sub>2</sub> emissions of 75g/km or less qualifies for a 100% discount on the London Congestion Charge in 2015/16.	The 75g/km CO <sub>2</sub> emissions threshold for the London Congestion Charge means any car with CO <sub>2</sub> emissions of 75g/km or less qualifies for a 100% discount on the London Congestion Charge in 2015/16.	The 75g/km CO <sub>2</sub> emissions threshold for the London Congestion Charge means any car with CO <sub>2</sub> emissions of 75g/km or less qualifies for a 100% discount on the London Congestion Charge in 2015/16.	The 75g/km CO <sub>2</sub> emissions threshold for the London Congestion Charge means any car with CO <sub>2</sub> emissions of 75g/km or less qualifies for a 100% discount on the London Congestion Charge in 2015/16.	Only the entry-level Toyota Yaris Hybrid with CO <sub>2</sub> emissions of 75g/km qualifies for the 100% discount on the London Congestion Charge in 2015/16.
REFUELLING	Recharging or refuelling – the combustion engine can drive the car and also charge the battery.	Recharging only.	Recharging or refuelling.	Hydrogen refuelling only.	Refuelling only.
CHARGING INFRASTRUCTURE	Widespread, as PHEVs can top up with fuel at a filling station or recharge using a domestic supply or the charging network.	Growing. There are currently thought to be more than 6,000 public charging points in the UK, although most are located in towns and cities.	Widespread as range-extender electric cars can top up with fuel at a filling station or recharge using a domestic supply or the charging network.	Very limited. There is no established nationwide refuelling network for hydrogen vehicles at present in the UK.	Widespread, using the existing filling station network.

Continued overleaf



## ALTERNATIVE FUEL VEHICLE COMPARISON. (Continued).

DRIVETRAIN	PLUG-IN HYBRID (PHEV) – EG. BMW X5 (PARALLEL HYBRID)	ELECTRIC VEHICLE (EV) – EG. BMW i3	ELECTRIC RANGE-EXTENDED VEHICLE (E-REV) – EG. BMW i3 RANGE EXTENDER (SERIES HYBRID)	HYDROGEN FUEL CELL VEHICLE – EG. TOYOTA MIRAI	TRADITIONAL HYBRID – EG. TOYOTA PRIUS, HONDA INSIGHT (PARALLEL HYBRID)
<b>ADVANTAGES</b>	High initial cost offset by plug-in car grant. Capable of electric running for longer than a traditional hybrid. Drivetrain eliminates range anxiety, while engine and electric motor offer strong acceleration together. Particularly efficient for urban driving, where general cruising speeds are lower.	Near silent running and smooth acceleration with peak torque from zero revs. No tailpipe emissions, and electricity is less expensive as a fuel than petrol or diesel.	Less 'range anxiety' than an electric car as the combustion engine is refuelled conventionally. Power delivery remains smooth and quiet from the electric motor.	Ultra-clean operation and silence on the road. Hydrogen is potentially abundant, and refuelling takes only 3-4 minutes. Performance is similar to a conventional car with a range of around 300 miles before refuelling is needed.	Can be less expensive to buy than an electric car or plug-in hybrid. Does not require plugging in, and is refuelled like a conventional car. Many manufacturers offer hybrids and the technology is now well understood after over 14 years on the market.
<b>DISADVANTAGES</b>	Fuel cost savings may take longer to realise than with a battery EV.	Limited range means it is better suited to shorter journeys. Longer journeys require planning with access to rapid charging en route.	Fuel economy when the engine is running can be disappointing, extra weight can compromise handling and fuel tanks for the range extender motor often tend to be small.	Expensive to buy and, at present, impractical as there is no established refuelling network in the UK. Hydrogen is highly flammable and is stored under pressure at refuelling sites and in the car.	Zero-emission electric-only driving makes it attractive in town and for short distances, while benefit-in-kind tax can be reduced compared with conventional cars. But motorway economy can be disappointing as the electric motor is used less.
<b>SUMMARY</b>	Likely to be a more popular choice than EVs for fleet operators and drivers, with more electric mileage and better performance available from the combination of plug-in charge and conventional fuel.	Limited because of range restrictions compared with other alternatives, although will be cheap to operate for roles where EVs are suited, eg. in-city driving.	Few manufacturers currently offer range extenders, but they have potentially greater appeal than pure EVs.	In its infancy as a practical mobility solution but with great potential. Infrastructure is needed to make it viable, while production and current purchase costs make it prohibitively expensive for most users.	Traditional hybrids have been accepted as an alternative to diesel by some fleets, particularly those based in urban areas.



## FUEL DUTY.

Fuel duty is paid on each litre of road fuel purchased (or per kilogram in the case of gases). Therefore the fuel efficiency of a vehicle, the way a vehicle is driven and the distance driven will determine the total amount of duty paid. Electricity is not subject to fuel duty, so battery electric vehicles are duty-exempt.

## GOVERNMENT ADVISORY FUEL RATES (AFR).

If you have a petrol-hybrid car, AFR petrol reimbursement rates apply; if you have a diesel-hybrid car, AFR diesel reimbursement rates apply. There is no HMRC-set AFR equivalent for pure electric vehicles because electricity is not considered to be a fuel for the purposes of Car Fuel Benefit legislation.

## FUEL BENEFIT CHARGE (FBC).

As electricity is not considered a fuel, there is currently no fuel benefit charge. This means that if an employer allows an employee with a company-owned or personally-owned car



to top up the battery of their battery-electric vehicle (BEV), plug-in hybrid electric vehicle (PHEV) or extended-range electric vehicle (E-REV) at work, this does not constitute a fuel benefit and no tax is payable.

The provision by an employer of a charging station for an employee to charge a private electric car gives rise to a benefit-in-kind.

In general terms, a benefit-in-kind is liable for tax and National Insurance contributions. If, however, the employer considers the benefit to be a 'trivial benefit', the employer can apply to HMRC for agreement to exclude the benefit from reporting grounds.

## ENHANCED CAPITAL ALLOWANCES (ECA).

Eligibility for enhanced capital allowances (ECA) for cars is based on CO<sub>2</sub> tailpipe emissions. If a car emits 75g/km or less, it qualifies for a 100% first-year capital allowance (FYA) until 31 March 2018, but the vehicle must be new and not used. Leased cars are not eligible for the 100% FYA.

Zero-emission goods vehicles are also eligible for a 100% first-year allowance until 31 March 2018.

## VEHICLE EXCISE DUTY (VED).

Cars with CO<sub>2</sub> emissions of 100g/km or less are zero-rated for first-year and standard VED in 2015/16, while cars that emit 101-130g/km of CO<sub>2</sub> are zero-rated for first-year VED only.

Cars that are not solely powered by petrol/diesel (eg. conventional hybrid vehicles) and emit more than 100g/km of CO<sub>2</sub> are classified as alternative fuel vehicles and are eligible for a £10 discount on the annual VED charge.

## VAT.

Vehicles are subject to standard levels of VAT (20%) regardless of their emissions of CO<sub>2</sub>, but electricity has varying treatment. Electricity that is supplied for domestic, non-business and charity use attracts 5% VAT, while electricity that is supplied for business use is subject to standard VAT at 20%.

Petrol, diesel and hydrogen are considered to be road fuels and therefore also attract the standard level of 20% VAT while electricity that is used to recharge a wholly battery-electric vehicle (BEV) or plug-in hybrid vehicle (PHEV) at home attracts VAT at 5%. Electricity for ULEVs that are recharged at work attract 20% VAT. Hydrogen used to refuel fuel-cell electric vehicles (FCEV) will also attract VAT at 20%.